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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to image processing performed according to the model of picture input/output device connected to the network.
[0002]
[Description of the Prior Art]The image data uploaded from the picture input device to the server using the Internet and other networks is downloaded, and the art to which a picture is made to output with an image output device has spread. The input of image data is made from a digital camera, a scanner, etc. The output of image data is performed in modes, such as a display to a display, and printing with a printer. In recent years, an accessible cellular phone and a portable mail terminal may be used for the Internet as the picture input device or image display device of a picture. Attaching the image data photoed with the digital camera with which the portable mail terminal was equipped to E-mail, and sending it, or uploading it to a server is also performed.
[0003]Generally, about digital image data, various image processing is performed in a process until it performs a generating picture from an input in many cases. As image processing, the halftone process which reduces the gradation number of each pixel, the color conversion process which changes the color system of original image data into the color system of an output unit, the contrast of image data, the compensation process of gradation, etc. are mentioned, for example. The picture input device, the server, and the image output device may be provided with the image processing function, respectively, and each is performing such image processing independently in this case. A server may bundle up such image processing and may perform it.
[0004]
[Problem(s) to be Solved by the Invention]Image data is inputted into a server from various

picture input devices, and the image data by which image processing was carried out is outputted to various image output devices. However, since the characteristic may change with a picture input device or image output devices in this case, the case where image processing which raises image quality is not performed appropriately arises. In order to solve this technical problem, after distinguishing the model of picture input/output device by a server, it is also possible to perform image processing depending on that model, but. When a demand of picture input and output occurs burstily, since superfluous load is applied to a server, causing another technical problem of it becoming impossible to process efficiently may arise.

[0005]Even if it is a case where image processing depending on a model is performed, image processing depending on the model of picture input/output device and image processing for which it does not depend exist in image processing which a server performs actually. There are some which do not necessarily need to be continuously performed to the time of the input of image data or the demand of a generating picture in these processings. However, it was not taken into consideration about to what kind of timing these processings are performed. Therefore, it may arise that it becomes impossible to perform efficiently input and output and image processing of image data.

[0006]This invention is made in order to solve an above-mentioned technical problem, and an object of this invention is to provide the art of aiming at increase in efficiency of image processing at the time of outputting and inputting image data using the picture input/output device connected to the network, effective use of hardware resources, and improvement in image quality.

[0007]

[The means for solving a technical problem, and its operation and effect] In order to solve at least a part of above-mentioned technical problem, the following composition was adopted in this invention. The 1st image processing device of this invention is an image processing device which performs image processing to the original image data inputted from two or more picture input devices connected to the network, The input device information acquisition section which acquires the input device information on said picture input device, The input device information dependence image processing portion which performs image processing for which it depended on said input device information to said original image data at the time of the input of said original image data, To the predetermined timing set up regardless of the storage parts store which memorizes the image data to which said input device information dependence image processing was performed, and the input of said original image data. Let it be a gist to have a non-depending image processing portion which performs image processing for which it does not depend on said input device information to the image data memorized by said storage parts store.

[0008]There is various apparatus in a picture input device, and there is the characteristic about

an image input peculiar to apparatus in them. The characteristic changes also with operating states of apparatus. In an image processing device of this invention, first, by [, such as apparatus, an operating state etc. of a picture input device,] acquiring input device information which affects image quality, the characteristic of a picture input device is specified and image processing for which it depended on the characteristic of a picture input device at the time of an input of original image data is performed. "Image processing is performed at the time of an input of original image data" means performing image processing taking advantage of an input of original image data. Therefore, image processing may be performed immediately after performing image processing, performing image processing in an exchange of a series of data accompanying an original-image-data input, and completing an exchange of a series of data accompanying data input, inputting original image data. As image processing here, amendment of color balance, change of image size, and processing according to picture input devices, such as noise rejection, are mentioned, for example. An image processing device once memorizes image data after performing these processings to a storage parts store. And image processing common to a complete aircraft machine for which it does not depend on a picture input device to predetermined timing set up regardless of an input of original image data is performed. As processing here, color correction, such as a color of skin, an empty color, and a color of trees, addition of sharpness, etc. are mentioned, for example.

[0009]What is necessary is to perform common image processing to not all image data to which image processing depending on a picture input device was performed, but just to perform required image processing suitably in image processing independent of a picture input device. Therefore, it is not necessary to perform unnecessary image processing, and image processing performed according to a kind of pictures, such as what is called natural pictures, an animation image, etc., may be changed, for example.

[0010]Thus, since suitable timing can be chosen and image processing which does not need to be immediately performed by performing image processing depending on the characteristic of a picture input device and image processing for which it does not depend to different timing can be performed, increase in efficiency of image processing can be attained. Since image processing according to a picture input device is chosen and is performed, improvement in image quality can be aimed at.

[0011]In the 1st image processing device of this invention, with "predetermined timing." As for said predetermined timing, although given time may be sufficient and it may be after [from an input of original image data] predetermined time, it has further the load Monitoring Department which supervises load of said image processing device, and it is preferred that it shall be a time of said load being below a predetermined value.

[0012]Since image processing independent of the characteristic of a picture input device can be dispersedly performed by carrying out like this when load of an image processing device is

light, hardware resources can be used effectively and it can process efficiently.
[0013]In the 1st image processing device of this invention, said two or more picture input devices shall contain two or more kinds of picture input devices, and said input device information shall be a kind of said picture input device.
[0014]A "kind" of picture input device means a classification of picture input devices, such as a personal computer as a digital camera, a scanner, and an image generating device. By specifying a kind of picture input device, suitable image processing according to the kind can be performed. As a result, image quality can be improved.
[0015]Said input device information is good also as what is a kind name of said picture input device.
[0016]A "kind name" of a picture input device means each kind name in a kind of each image processing device. For example, a liquid crystal display panel of a cellular phone may differ in display properties depending on the model. In such a case, by specifying a kind name, suitable image processing according to the model can be performed. As a result, image quality can be improved.
[0017]Said input device information is good also as what is an operating state of said picture input device.
[0018]An "operating state" of a picture input device means a photographing condition of a digital camera, image taking conditions of a scanner, and various setting out, for example. Suitable image processing can be performed also by specifying these. As a result, image quality can be improved.
[0019]The 2nd image processing device of this invention performs image processing to inputted original image data, An output-characteristics information acquisition section which is an image processing device which generates data for supplying two or more image output devices connected to a network, and acquires output-characteristics information about the output characteristics of said image output device, A non-depending image processing portion which performs image processing for which it does not depend on said output-characteristics information to said original image data to predetermined timing set up regardless of a generating picture demand, Let it be a gist to have a storage parts store which memorizes image data to which said non-depending image processing was performed, and an output-characteristics information dependence image processing portion which performs image processing for which it depended on said output-characteristics information to image data memorized by said storage parts store at a generating picture demand.
[0020]In an image processing device of this invention, image processing common to a complete aircraft machine for which it does not depend on the output characteristics of an image output device to inputted original image data to predetermined timing first set up regardless of a demand of a generating picture is performed. As processing here, addition of

color correction, such as amendment of color balance, change of image size, noise rejection of original image data, a color of skin, an empty color, a color of trees, and sharpness, etc. are mentioned, for example. What is necessary is to perform common image processing to not all inputted original image data, but just to perform required image processing suitably in image processing independent of an image output device. Therefore, it is not necessary to perform unnecessary image processing, and image processing performed according to a kind of pictures, such as what is called natural pictures, an animation image, etc., may be changed, for example.

[0021]An image processing device memorizes image data to which these processings were performed to a storage parts store. And output-characteristics information about the output characteristics of an image output device is acquired to a demand of a generating picture, and image processing according to the output characteristics of an image output device is performed to image data memorized at a storage parts store. A halftone process reduced as processing here to a gradation number which can express a gradation number of each pixel, for example, a color conversion process which changes a color system of image data into a color system of an image output device, contrast of image data, an amendment place of gradation, etc. are mentioned. About a demand of a generating picture to an image processing device, a request destination and an output destination change may be in agreement, or it may not be in agreement.

[0022]Thus, since suitable timing can be chosen and image processing which does not need to be immediately performed by performing image processing depending on the output characteristics of an image output device and image processing for which it does not depend to different timing can be performed, Increase in efficiency of image processing at the time of outputting image data can be attained. Since image processing according to the output characteristics of an image output device is chosen and is performed, improvement in image quality can be aimed at.

[0023]In the 2nd image processing device of this invention, it has further the load Monitoring Department which supervises load of said image processing device, and, as for said predetermined timing, it is preferred that it shall be a time of said load being below a predetermined value.

[0024]Since image processing can be distributed by carrying out like this when load of an image processing device is light, hardware resources can be used effectively and it can process efficiently.

[0025]In the 2nd image processing device of this invention, said two or more image output devices shall contain two or more kinds of image output devices, and said output-characteristics information shall be a kind of said image output device.

[0026]A "kind" of image output device means a classification of image output devices, such as

a printer and an image display device. For example, in outputting to a printer, it performs processing which changes image data into a CMY system from a RGB system. By specifying a kind of image output device, suitable image processing according to the kind can be performed.

[0027]Said output-characteristics information is good also as what is a kind name of said image output device.

[0028]For example, when an image output device is a liquid crystal display, even if it is the same image data, expression may be made for a picture with brightness which changes with the drive systems. Also in a printer, since a color (ingredient) of ink used depending on the model and a kind (dye ink and pigment ink) of ink differ from the number of ink to be used, required image processing differs. In this invention, since it is possible to specify the generating picture characteristic and to perform suitable image processing according to this by a kind name of an image display device, image quality can be improved.

[0029]Said output-characteristics information is good also as what is an operating state of said image output device.

[0030]With an "operating state" of an image output device, setting out of display contrast, temperature of an operating environment, humidity, etc. are mentioned, for example. When an image output device is a liquid crystal display, the penetration characteristic of a liquid crystal changes with temperature. When an image output device is an ink-jet printer, the regurgitation characteristic of ink changes with temperature or humidity. Suitable image processing can be performed by specifying an operating state of such an image output device. As a result, image quality can be improved.

[0031]This invention can also be constituted as an invention of an image processing method besides composition as an above-mentioned image processing device. It is possible to realize in various modes, such as a computer program which realizes these and a recording medium which recorded the program, and a data signal embodied in a subcarrier including the program. In each mode, it is possible to apply various added components shown previously.

[0032]When it constitutes this invention as a recording medium etc. which recorded a computer program or its program, it is good also as what is constituted as the whole program which drives an image processing device, and good also as what constitutes only a portion which achieves a function of this invention. As a recording medium, a flexible disk, and CD-ROM, a magneto-optical disc, Various media which computers, such as internal storage (memories, such as RAM and ROM), an external storage, etc. of printed matter and a computer with which numerals, such as an IC card, a ROM cartridge, a punch card, and a bar code, were printed, can read can be used.

[0033]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described in order

of the following based on an example.
A. system configuration: -- B. image-processing: -- C. 2nd example: -- image-processing [of the D. 2nd example]: -- E. modification: [0034]A. System configuration : drawing 1 is an explanatory view showing the composition of the picture display system provided with the image processing device as the 1st example of this invention. The server 100 is connected to Internet INT. This server 100 functions as an image processing device of this invention. Internet INT is passed and the personal computers 30A and 30B which installed the cellular phones 10A, 10B, and 10C as a picture input device or an image output device and the application program for creating and processing a picture are connected to the server 100. The cellular phones 10A and 10B are provided with the color liquid crystal panel which can display 256 colors. The cellular phone 10B carries the digital camera. The cellular phone 10C is provided with the monochrome liquid crystal panel which can display monochrome 4 gradation. The portable mail terminals 20A and 20C which carry a digital camera, respectively are connected to the cellular phones 10A and 10C. The portable mail terminals 20A and 20C are provided with the color liquid crystal panel which can display about 65000 colors.
[0035]The ink-jet printers 40A and 40B are also connected to the server 100 as an image output device via Internet INT. The ink-jet printers 40A are cyanogen, magenta, Hierro, and a printer that prints using the ink of four colors of black. The ink-jet printer 40B is a printer which prints using the ink of cyanogen, magenta, Hierro, light cyan, light magenta, and six colors of black. Light cyan ink and light magenta ink are ink whose concentration is thinner than cyan ink and magenta ink.
[0036]Drawing 2 is an explanatory view showing the functional block of the server 100. The server 100 is provided with the following.
Original-image-data input part 110.
Input device information acquisition section 120.
Image processing parameter storage parts store 130.
The input device information dependence image processing portion 140, the 1st image data memory section 150, the non-depending image processing portion 160, the 2nd image data memory section 170, the image data output part 180, and the load Monitoring Department 190. These functional blocks are built by software by the server 100. Although the case where all the functional blocks are prepared for the single server 100 is illustrated in this example, it is good also as what carries out distributed processing by two or more servers.
[0037]The image data acquired with the digital camera which is not illustrated or the scanner by the original-image-data input part 110, The image data which used the application program installed in the personal computer, and was created and processed is inputted via Internet INT or the Local Area Network which is not illustrated by various file formats, such as BMP, GIF, JPEG, and TIFF.

[0038]The input device information acquisition section 120 acquires the information for specifying the characteristic of a picture input device at the time of the input of the original image data from a picture input device. For example, operating states, such as a kind name of a picture input device, a photographing condition in a digital camera, and image taking conditions in a scanner, are acquired. This information may be acquired from a picture input device, and may be acquired from what was added to the file format of image data.
[0039]Two or more various parameters for using for image processing performed in the image processing parameter storage parts store 130 according to the input device information which the input device information acquisition section 120 acquired are memorized beforehand. As this parameter, there are a look-up table etc. which are used for color balance amendment.
[0040]The input device information dependence image processing portion 140 chooses the optimal parameter from the image processing parameter storage parts store 130 according to input device information, and performs image processing depending on input device information. In this image processing, amendment of color balance, change of image size, noise rejection of image data, etc. are performed if needed, for example. Since these processings are well-known art, they omit explanation.
[0041]The 1st image data memory section 150 once memorizes the image data processed by the input device information dependence image processing portion 140.
[0042]The load Monitoring Department 190 is monitoring the load of the server 100 continuously. The load of the server 100 in which the load Monitoring Department 190 measures image processing independent of input device information performs the non-depending image processing portion 160 to the timing below a predetermined value to the image data memorized by the 1st image data memory section 150. In this image processing, addition of color correction, such as a color of skin, an empty color, and a color of trees, and sharpness, etc. are performed, for example.
[0043]The 2nd image data memory section 170 memorizes the image data processed by the non-depending image processing portion 160. The image data output part 180 transmits the image data memorized by the 2nd image data memory section according to the demand of a generating picture to an image output device.
[0044]B. Image processing : in this example, the data of the picture photoed with the digital camera with which the portable mail terminal 20A was equipped shall be inputted. After amendment of color balance, change of image size, noise rejection of original image data, color correction, such as a color of skin, an empty color, and a color of trees, and processing of addition of sharpness are performed, the inputted image data, It shall be saved in the server 100 as data for download to an image output device. According to the flow chart shown below, these image processing is divided into two timing, and is performed.
[0045]Drawing 3 is a flow chart of an image data input process. First, it is inputted into the

original-image-data input part 110 when the data of the picture photoed with the digital camera with which the portable mail terminal 20A was equipped communicates using the cellular phone 10A (Step S100). And the kind name of the portable mail terminal 20A and the photographing condition of a digital camera are acquired as input device information by the input device information acquisition section 120 (Step S110). By this, the server 100 specifies the characteristic of a picture input device and an inputted image. Step S100 and Step S110 may make an order reverse.

[0046]As image processing which chose the parameter for performing optimal image processing according to the acquired input device information from the image processing parameter storage parts store 130 (Step S120) and for which it depended on input device information, amendment of color balance, Change of image size and noise rejection of original image data are performed (Step S130). And the image data which input device information dependence image processing ended is once memorized to the 1st image data memory section 150 (Step S140).

[0047]Next, it is judged whether the load of the server 100 which the load Monitoring Department 190 measured is below a predetermined value (Step S150). In this example, the working ratio of CPU of the server 100 is supervised as load of the server 100. If load is below a predetermined value, color correction, such as a color of skin, an empty color, and a color of trees, and addition of sharpness will be performed as non-depending image processing (Step S160). If load is not below a predetermined value, it will stand by until it reaches below a predetermined value. In this example, although the working ratio of CPU was used as load of the server 100, the traffic volume of data communications may be used. The "predetermined value" used as the decision criterion of whether to perform non-depending image processing can be set up arbitrarily not have an adverse effect on data communications or input device information dependence image processing.

[0048]The image data which non-depending image processing ended is memorized to the 2nd image data memory section 170 (Step S180), and an image data input process is ended. This image data is outputted from the image data output part 180 according to the demand of a generating picture.

[0049]Thus, since according to the 1st example suitable timing can be chosen and image processing which does not need to be immediately performed by performing image processing depending on the characteristic of a picture input device and image processing for which it does not depend to different timing can be performed, the increase in efficiency of image processing can be attained. Since image processing according to the characteristic of the picture input device is chosen and is performed, improvement in image quality can be aimed at. Since image processing independent of the characteristic of a picture input device is performed when the load of a server is light, effective use of hardware resources can also be

aimed at.

[0050]C. The 2nd example : drawing 4 is an explanatory view showing the functional block of the image processing device (server 100A) as the 2nd example of this invention. The server 100A is provided with the following.

Original-image-data input part 110A.

Original picture data storage part 120A.

The non-depending image processing portion 130A.

The image data memory section 140A, the output-characteristics information acquisition section 150A, the image processing parameter storage parts store 160A, the output-characteristics information dependence image processing portion 170A, the image data output part 180A, and the load Monitoring Department 190A.

These functional blocks are built by software by the server 100A like the 1st example. Although the case where all the functional blocks are prepared for the single server 100A also in the 2nd example is illustrated, it is good also as what carries out distributed processing by two or more servers.

[0051]Original image data is inputted into the original-image-data input part 110A via the Internet or a Local Area Network like the original-image-data input part 110 of the 1st example. The original picture data storage part 120A once memorizes the inputted original image data.

[0052]The load Monitoring Department 190A is monitoring the load of the server 100A continuously. The load of the server 100A in which the load Monitoring Department 190A measures image processing independent of the output characteristics of an image output device performs the non-depending image processing portion 130A to the timing below a predetermined value to the image data memorized by the original picture data storage part 120A. In this image processing, addition of color correction, such as amendment of color balance, change of image size, noise rejection of image data, a color of skin, an empty color, a color of trees, and sharpness, etc. are performed if needed, for example.

[0053]The image data memory section 140A once memorizes the image data processed by the non-depending image processing portion 130A.

[0054]The output-characteristics information acquisition section 150A acquires the output-characteristics information about the output characteristics of the image output device to output synchronizing with the demand of a generating picture. For example, the kind name of an image output device, output setting out, and the data of an operating environment are acquired.

[0055]Two or more various parameters for using for image processing performed in the image processing parameter storage parts store 160A according to the output-characteristics information which the output-characteristics information acquisition section 150A acquired are memorized beforehand. As this parameter, there are a dither matrix used for a halftone

process, a look-up table used for gray level correction, color data conversion for changing the color system of image data into a CMYK system from a RGB system, etc., for example.
[0056]The output-characteristics information dependence image processing portion 170A chooses the optimal parameter from the image processing parameter storage parts store 160A according to output-characteristics information, and performs image processing depending on an output unit. In this image processing, the various processings for improving image quality, such as a halftone process by definition conversion, a dither method, or an error diffusion method, gray level correction according to the display properties of the image output device, and a color conversion process that changes a color system, are performed if needed. Conversion of a file format is also performed so that the output to each image output device other than these processings may be possible. Since these processings are well-known art, they omit explanation.
[0057]The image data output part 180A transmits the image data which output-characteristics information dependence image processing ended to an image output device.
[0058]D. Image processing of the 2nd example : in this example, the picture photoed with the digital camera with which the portable mail terminal 20A was equipped shall be displayed on the color liquid crystal panel of the cellular phone 10B. It shall be outputted, after the data of the picture photoed with the digital camera is inputted into the server 100A and removal of a noise, change of image size, amendment of a gradation value, and the halftone process by a dither method are performed. According to the flow chart shown below, these image processing is divided into two timing, and is performed.
[0059]Drawing 5 is a flow chart of an image data input process. First, it is inputted into the original-image-data input part 110A of the server 100A when the data of the picture photoed with the digital camera with which the portable mail terminal 20A was equipped communicates using the cellular phone 10A (Step S200). This original image data is once memorized to the original picture data storage part 120A (Step S210A).
[0060]And it is judged whether the load of the server 100A which the load Monitoring Department 190A measured is below a predetermined value (Step S220). Also in the 2nd example, the working ratio of CPU of the server 100A is supervised as load of the server 100A like the 1st example. If load is below a predetermined value, as non-depending image processing, the noise rejection of image data will be performed and a change of image size will be made (Step S230). If load is not below a predetermined value, it will stand by until it reaches below a predetermined value. A "predetermined value" can be set up arbitrarily. The image data which non-depending image processing ended is memorized to the image data memory section 140A (Step S240), and an image data input process is ended.
[0061]Drawing 6 is a flow chart of an image data output process. If the demand of a generating picture is received from the cellular phone 10B (Step S250), the server 100A as output-

characteristics information about the output characteristics of the cellular phone 10B, The kind name of the cellular phone 10B, output setting out (the adjustment value of display contrast, ON/OFF of a back light, etc.), and the data of an operating environment (temperature, luminosity) are acquired from the cellular phone 10B (Step S260).

[0062]As a parameter for performing optimal image processing according to the acquired output-characteristics information, the look-up table for gray level correction and the dither matrix for a halftone process are chosen from the image processing parameter storage parts store 160A (Step S270). And amendment of a gradation value and the halftone process by a dither method are performed as output-characteristics information dependence image processing (Step S280). And image data is transmitted to an image output device from the image data output part 180A (Step S290).

[0063]Thus, since according to the 2nd example suitable timing can be chosen and image processing which does not need to be immediately performed by performing image processing independent of the output characteristics of an image output device and image processing for which it depends to different timing can be performed, the increase in efficiency of image processing can be attained. Since image processing according to the output characteristics of the image output device is chosen and is performed, improvement in image quality can be aimed at. Since image processing independent of the output characteristics of an image output device is performed when the load of a server is light, effective use of hardware resources can also be aimed at.

[0064]Since the image processing device of the 1st and 2nd examples explained above includes processing by a computer, it can also take the mode of operation as a recording medium which recorded the program for realizing this processing. As such a recording medium, a flexible disk and CD-ROM, Various media which computers, such as internal storage (memories, such as RAM and ROM) of the printed matter in which numerals, such as a magneto-optical disc, an IC card, a ROM cartridge, a punch card, and a bar code, were printed, and a computer, and an external storage, can read can be used.

[0065]E. Modification : although the embodiment of the invention was described above, operation in the mode which becomes various within limits which are not limited to such an embodiment at all and do not deviate from the gist is possible for this invention. For example, the following modifications are also possible.

[0066]E1. modification 1: The 1st example showed the image processing device which performs image processing depending on a picture input device, and image processing for which it does not depend to different timing. The 2nd example showed the image processing device which performs image processing independent of an image output device, and image processing for which it depends to different timing. The image processing device of a modification has the feature of the 1st example and the 2nd example. That is, at the time of the

input of image data, image processing depending on a picture input device is performed, and image processing for which it depended on the image output device at the generating picture demand is performed. It is equivalent to the mode which applied image processing depending on an image output device as non-depending image processing (image processing independent of a picture input device) in the 1st example. It is equivalent to the mode which applied image processing depending on a picture input device simultaneously as non-depending image processing (image processing independent of an image output device) in the 2nd example.

[0067]Drawing 7 is an explanatory view showing the functional block of the image processing device (server 100B) as a modification. The server 100B is provided with the following.

Original-image-data input part 110B.

Input device information acquisition section 120B.

Image processing parameter storage parts store 130B.

The input device information dependence image processing portion 140B, the image data memory section 150B, the output-characteristics information acquisition section 160B, the output-characteristics information dependence image processing portion 170B, the image data output part 180B, and the load Monitoring Department 190B.

[0068]The function of each part is the same as that of the thing of the 1st and 2nd examples. The image processing parameter storage parts store 130B has memorized two or more parameters for performing image processing depending on the characteristic of a picture input device and an image output device. The input device information dependence image processing portion 140B and the output-characteristics information dependence image processing portion 170B perform suitable image processing using the parameter chosen from the image processing parameter storage parts store 130B. The processing at the time of an image data input is the same as Step S100 of the 1st example shown in drawing 3 - Step S140. The processing at the time of a generating picture is the same as the thing of the 2nd example shown in drawing 6. According to such a modification, suitable image processing can be performed according to the both sides of a picture input device and an image output device.

[0069]E2. modification 2: Although image processing common to the complete aircraft kind of an image output device including an image display device and a printer shall be performed in non-depending image processing in the 2nd example of the above, it is good also as what performs common image processing for every image display device from which a color system differs, and every printer, for example.

[0070]E3. modification 3: Although the above-mentioned example showed the example which outputs the picture photoed with the digital camera with which the portable mail terminal 20A

was equipped to the color liquid crystal panel of the cellular phone 10B, it is not restricted to this. It may be made to output to other image output devices. For example, it may be made to output to the portable mail terminal 20C, may be made to output to the personal computers 30A and 30B, and may be made to output to the ink-jet printers 40A and 40B. Other apparatus may be used as a picture input device. The processing etc. which change into the image data of 8 bits each of RGB the image data inputted as non-depending image processing by the index color besides removal of the noise of image data or change of image size mentioned above are mentioned. The various processings for improving image quality, such as a halftone process by definition conversion, a dither method, an error diffusion method, etc., amendment of the gradation value according to the output characteristics of the image output device, and a color conversion process that changes a color system into a CMYK system from a RGB system, as output-characteristics information dependence image processing are mentioned. The data of a RGB system or a CMY system is communicated, and also it may communicate using a Y signal (luminance signal) and C signal (color-difference signal).

[0071]E4. modification 4: Although the demand from the cellular phone 10B which displays a picture is performing image processing in the above-mentioned example, it may demand to output to other image output devices. For example, an image processing device may be required to output a picture to the ink-jet printer 40B from the cellular phone 10B.

[0072]E5. modification 5: In the above-mentioned example, when the load of a server is light, non-depending image processing is performed, but it is not restricted to this. For example, it may be made to carry out at predetermined time. When the load of a server is light, non-depending image processing including two or more processings is performed at a time, but when the load of a server is light respectively, it may be made to perform each processing dispersedly.

[Translation done.]